



51.  $y''_{xx} = f(y'_x{}^2 + ay)$ .

The substitution  $w(y) = (y'_x)^2 + ay$  leads to a first-order separable equation:  $w'_y = 2f(w) + a$ .

### Reference

**Polyanin, A. D. and Zaitsev, V. F.**, *Handbook of Exact Solutions for Ordinary Differential Equations*, 2nd Edition, Chapman & Hall/CRC, Boca Raton, 2003.